

A method and apparatus for assay of multiple analytes. The method uses a sensing element comprising a substrate upon which is arranged a multiplicity of recognition elements, such that each element is laid out in a predetermined pattern. Each pattern is unique in that it can give rise to a characteristic diffraction pattern in the assay. The patterns may or may not be interpenetrating on the substrate surface. The method of detecting multiple analytes includes contacting the medium of analytes with the patterned substrate, illuminating the substrate by a light source, and detecting any resultant diffraction image. The pattern of diffraction and the intensity of the diffracted signal provides information about the existence of specific analytes and their quantification.